

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

Claim 1 (Canceled). ~~A semiconductor device comprising:~~

- ~~—— a substrate;~~
- ~~—— a plurality of substantially non load-bearing inter-level dielectric (ILD) layers each formed of a dielectric material having a low dielectric constant (k);~~
- ~~—— at least one load-bearing support structure disposed in each of the ILD layers at locations overlying each other so that support structures vertically aligned with each other through the plurality of layers to mitigate structural damage of the plurality of ILD layers caused by stresses to the plurality of ILD layers;~~
- ~~—— at least one additional ILD layer having a dielectric constant which is higher than the plurality of ILD layers, the at least one additional ILD layer overlying the plurality of ILD layers;~~
- ~~—— a contact layer overlying the at least one additional ILD layer and the support structures, wherein the at least one additional ILD layer isolates the contact layer from the support structures; and~~
- ~~—— a bond pad overlying the contact layer, each of the vertically aligned load-bearing support structures substantially aligned with a center axis of the bond pad.~~

Claim 2 (Currently Amended). The semiconductor device of claim ~~4~~27, wherein at least one ILD layer has an ultra low dielectric constant (k).

Claim 3 (Currently Amended). The semiconductor device of claim ~~1~~27, wherein the at least one support structure is one of a trench and via formed from a support material.

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Claim 4 (Original). The semiconductor device of claim 3, wherein the support material comprises at least one of aluminum, aluminum alloy, copper, copper alloy, tungsten, or tungsten alloy.

Claim 5 (Currently Amended). The semiconductor device of claim ~~4~~27, wherein the support structure mitigates damage of the plurality of ILD layers due to forces applied onto the plurality of ILD layers during one of a subsequent processing and packaging of the semiconductor device.

Claim 6 (Canceled).

Claim 7 (Currently Amended). The semiconductor device of claim ~~4~~27, wherein the support structures are located underneath the source of the stress to mitigate damage to the semiconductor device.

Claim 8 (Original). The semiconductor device of claim 7, the source of the stress being a bond pad location.

Claim 9 (Canceled).

Claim 10 (Currently Amended). The semiconductor device of claim ~~10~~27, the support column ending at the at least one additional ILD layer.

Claim 11 (Canceled).

Claim 12 (Currently Amended). A semiconductor device comprising:
a substrate;

a plurality of substantially non load bearing inter-level dielectric (ILD) layers each having a low dielectric constant (k);

a plurality of load bearing support structures disposed in each of the ILD layers at locations overlying each other so that the support structures are vertically aligned with each other through the plurality of layers to mitigate structural damage of the plurality of ILD layers caused by stresses to the plurality of ILD layers;

at least one additional ILD layer having a dielectric constant which is higher than the plurality of ILD layers, the at least one additional ILD ~~layer-layer~~ overlying the plurality of ILD layers;

a contact layer overlying the at least one additional ILD layer and the support structures, wherein the at least one additional ILD layer isolates the contact layer from the support structures;

wherein ~~a~~ the plurality of support structures are disposed in ~~[[the]]~~ at least one of the plurality of ~~dielectric ILD~~ layers in an $n \times m$ matrix configuration, where n and m are integers greater than one; and

wherein each of the plurality of support structures of each matrix configuration are vertically aligned and the matrix configurations are uniformly distributed below and corresponding to a size of a bond pad disposed on the semiconductor device.

Claim 13 (Currently Amended). The semiconductor device of claim 12, wherein the plurality of support structures are disposed in the plurality of ILD ~~layers-layers~~ at a plurality of locations spaced equidistant apart from each other across substantially the entirety of each of the plurality of ILD layers.

Claims 14-23 (Canceled).

Claim 24 (Canceled). ~~A semiconductor device comprising:~~
~~— a substrate;~~

—— a plurality of substantially non load bearing inter-level dielectric (ILD) layers each formed of a dielectric material having a low dielectric constant (k);
—— at least one load bearing support structure disposed in each of the ILD layers at locations overlying each other so that support structures are vertically aligned with each other through the plurality of layers to mitigate structural damage of the plurality of ILD layers caused by stresses to the plurality of ILD layers;
—— at least one additional ILD layer having a dielectric constant which is higher than the plurality of ILD layers, the at least one additional ILD layer overlying the plurality of ILD layers;
—— a bond pad overlying the at least one additional ILD layer and the support structures, each of the vertically aligned load bearing support structures substantially aligned with a center axis of the bond pad.

Claim 25 (Currently Amended). The semiconductor device of claim ~~4~~27, wherein the low dielectric constant (k) of the dielectric material of the plurality of ILD layers has a value between about 1.0 and about 3.8.

Claim 26 (Previously Presented). The semiconductor device of claim 2, wherein the ultra low dielectric constant (k) of the dielectric material of the plurality of ILD layers has a value between about 1.0 and about 2.7.

Claim 27 (Currently Amended). ~~The semiconductor device of claim 1, A semiconductor device comprising:~~

a substrate;
a plurality of substantially non load bearing inter-level dielectric (ILD) layers each formed of a dielectric material having a low dielectric constant (k);
at least one load bearing support structure disposed in each of the ILD layers at locations overlying each other so that the support structures are vertically aligned with each other through

the plurality of layers to mitigate structural damage of the plurality of ILD layers caused by stresses to the plurality of ILD layers;

at least one additional ILD layer having a dielectric constant which is higher than the plurality of ILD layers, the at least one additional ILD layer overlying the plurality of ILD layers;

a contact layer overlying the at least one additional ILD layer and the support structures, wherein the at least one additional ILD layer isolates the contact layer from the support structures; and

a bond pad overlying the contact layer, each of the vertically aligned load bearing support structures substantially aligned with a center axis of the bond pad;

wherein the at least one support structure is a plurality of support structures, the semiconductor device further comprising a solder bump overlying the contact surface, the plurality of support structures being located directly underneath the solder bump.

Claim 28 (Currently Amended). The semiconductor device of claim 4, 27, wherein the at least one support structure that is a plurality of support structures comprises a first plurality of support structures extending along a length of the semiconductor device and a second plurality of support structures extending along a width of the semiconductor device, the first and second plurality of support structures intersecting perpendicularly with respect to each other.

Claim 29 (Previously Presented). The semiconductor device of claim 12, wherein the low dielectric constant (k) of the dielectric material of the plurality of ILD layers has a value between about 1.0 and about 3.8.

Claim 30 (Previously Presented). The semiconductor device of claim 12, wherein the $n \times m$ plurality of support structures are configured such that the n support structures extend along a length of the semiconductor device and the m support structures extend along a width of the

semiconductor device, the plurality n support structures and the plurality m support structures intersecting perpendicularly with respect to each other.

Claim 31 (Currently Amended). The semiconductor device of claim 24³², wherein the low dielectric constant (k) of the dielectric material of the plurality of ILD layers has a value between about 1.0 and about 3.8.

Claim 32 (Currently Amended). ~~The semiconductor device of claim 24.~~ A semiconductor device comprising:

a substrate;

a plurality of substantially non load bearing inter-level dielectric (ILD) layers each formed of a dielectric material having a low dielectric constant (k);

at least one load bearing support structure disposed in each of the ILD layers at locations overlying each other so that the support structures are vertically aligned with each other through the plurality of layers to mitigate structural damage of the plurality of ILD layers caused by stresses to the plurality of ILD layers;

at least one additional ILD layer having a dielectric constant which is higher than the plurality of ILD layers, the at least one additional ILD layer overlying the plurality of ILD layers; and

a bond pad overlying the at least one additional ILD layer and the support structures, each of the vertically aligned load bearing support structures substantially aligned with a center axis of the bond pad;

wherein the at least one support structure is a plurality of support structures, the plurality of support structures being located directly underneath the bond pad.

Claim 33 (Currently Amended). The semiconductor device of claim 24³², wherein the at least one support structure that is a plurality of support structures comprises a first plurality of support structures extending along a length of the semiconductor device and a second plurality of

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support structures extending along a width of the semiconductor device, the first and second plurality of support structures intersecting perpendicularly with respect to each other.